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STERILIZATION OF INSTRUMENTS

BY H. D. FAIR, M.D.
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WHEN the individual has access to boiling water, and the instruments to be sterilized are metal, the process is a very simple one, for heat is the best of all sterilizers or germicides, and any instrument that has been boiled for twenty or more minutes is rendered absolutely safe, so far as the probability of conveying infection is concerned.

You are all familiar with the commercial sterilizers of both the high and low pressure type, so no description is here necessary; but I will illustrate a convenient apparatus I have arranged for my own office, where I have an ample steam pressure seven months in the year. The sterilizer proper is made of sheet copper containing a perforated, removable tray. At one end of the pan is a nipple that fits into one end of a reinforced rubber tubing; that manufactured for gas or compressed air machines is most durable.

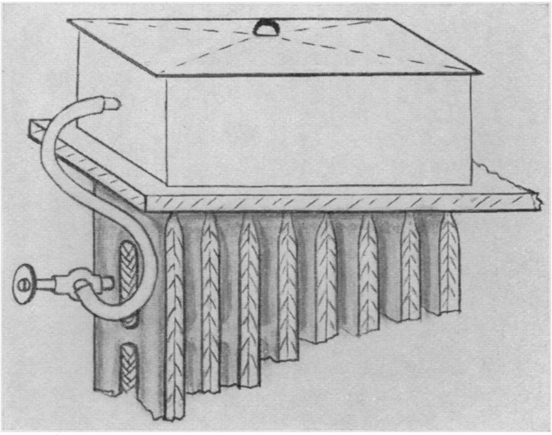
The valve on my radiator is of the ordinary wheel type, but I had the nipple somewhat enlarged and elongated by the addition of a little common solder. The attachment of the other end of the hose to this nipple carries the steam into the copper box containing the instruments or dressings to be sterilized. When not in use the radiator valve is closed and the hose laid to one side.

During the professional services of every physician and nurse there do come occasions when and where heat, neither moist nor dry, is available. There are also instruments and appliances in use which for one reason or another must not be boiled or heated to a degree necessary for complete sterilization, so it becomes imperative that all who have the responsibility of making preparations for operative procedures, be familiar with the best methods.

Preparations containing alcohol or ether or both are in common use; one of the best being "Harrington's Solution," the composition of which is as follows: mercuric chloride, 3.20; hydrochloric acid, 240.00; aqua dist., 1200.00; alcohol, 2560.00.

This compound is used for the disinfection or sterilization of anything that needs it, after thorough cleansing with soap and water.

Bichloride of mercury has been for years, and now is considered, the most efficient among antiseptics by many surgeons and nurses, but I believe it could be the most easily spared and would be least regretted of all the antiseptics or germicides in common use. Solutions of effective



STERILIZER ATTACHED TO A RADIATOR

strength ruin the appearance and destroy the keenness of all instruments with which they are brought in contact, and are irritating to the skin of nearly all who use them.

In the *Journal of the American Medical Association* for November 5, 1910, Drs. Wilbur E. Post and Homer K. Nicoll, of Chicago, published the results of an elaborate test of the actual germicidal power of the most popular and commonly used germicides. Their experiments were made with colonies of streptococcus obtained by blood-culture from a case of puerperal septicemia; the pneumococcus from blood-culture in a case of typical lobar pneumonia; the gonococcus was isolated from a urethral discharge; the bacillus typhosus was obtained directly from blood-cultures. All of the organisms were grown only on blood agar after being obtained.

Their report was an eye-opener to those who had based their faith on some of the so-called old reliables.

One of the greatest surprises was in connection with bichloride of mercury, when it was found that organisms immersed in a 1 to 500 solution were still living in large numbers at the end of ten minutes and one colony of gonococcus was obtained after thirty minutes. "In 1 to 2000 solution there was almost no apparent effect in thirty minutes, although disinfection was complete after twenty hours. Contrary to a prevalent opinion, solutions of bichloride of mercury are absolutely ineffective where prompt disinfection is required, as in the disinfection of hands and fields of operation."

On the other hand the tincture of green soap killed all organisms in less than one minute, as did also silver nitrate in any proportion above 1–1000: tincture of iodine diluted to 1–100 and phenol in 5 per cent. solutions. Cupric sulphate, in a dilution of 1–1000 showed a distinct effect after thirty minutes, and was entirely destructive in twenty hours.

Creolin, kreso and lysol in 1–100 solutions proved entirely effective in one minute. Therefore in green soap, silver nitrate 1–100 to 1–1000, tincture of iodine 1–100, creolin 1–100, kreso 1–100, lysol 1–100 and in alcohol 50 per cent. we have effective germ destroyers which do their work immediately, and this is a matter of great importance in emergency work or where a necessary instrument becomes contaminated during an operation.

About fifteen years ago Dr. G. V. Black (DD.S.), of the North Western University, made some very emphatic statements regarding the virtues of oil of cassia or cinnamon, clear and diluted. Later investigators have demonstrated that the ordinary U.S.P. cinnamon water is a better germicide than 1–1000 bichloride of mercury solution. It has also three other features that tend to recommend its use, viz., it is absolutely non-poisonous, it is of an agreeable refreshing odor, and is inexpensive.

The sterilization of rubber gloves requires especial care and precaution. Rubber is short lived at best and frequent boilings or ordeals in a high pressure sterilizer hasten the end of the term of usefulness. After use, the gloves should be thoroughly cleansed with water and green soap and then dried. This rule applies to catheters as well. If this is properly done, five to seven minutes in the steam cylinder will destroy all bacteria. The vitality of rubber catheters may be prolonged by soaking occasionally in weak ammonia water. When gloves are boiled before being laid away they should be dried quickly and dusted inside and out with talcum powder, and wrapped in a sterile towel.

The water in which plated instruments are to be boiled should be rendered alkaline by the addition of ½ to 1 per cent. of carbonate of sodium. This renders the polish brighter and lessens the tendency to rust. The edges of knives and sharp instruments should be protected by a wrapping of absorbent cotton.

Conclusions: Kreso, a coal-tar product consisting largely of cresols and higher phenols, which can be purchased for less than $1 per gallon will, in a one per cent. solution, destroy all pathologic germs in less than sixty seconds. Kreso is mentioned rather than lysol or creolin because of its low price.

Bichloride of mercury solutions in the strength usually prepared are worthless for quick sterilization of instruments.

Where time is no object and ample facilities are at hand, heat answers all requirements necessary to complete and absolute sterilization.

ENTERTAINMENT AND NURSING OF CHILDREN

By ALICE JANE DREW, R.N.
Graduate of the Laura Franklin Hospital, New York City.

So many nurses dread to be called on a case where the patient is a child, but I am never as happy as when caring for children. Perhaps the little folks realize this, and are usually on their good behavior.

One little fellow I was called to care for had the measles. He was very peevish, as most of us would be if we had the measles. He overheard the doctor tell his mother that she would need a nurse to help her. That was enough. The little six-year-old man told his mother emphati-